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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference XA1579	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/GB 03/04895	International filing date (day/month/year) 12.11.2003	Priority date (day/month/year) 20.11.2002

International Patent Classification (IPC) or both national classifications

Applicant

BAE SYSTEMS PLC et al.



- This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☒ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 13.05.2004	Date of completion of this report 23.08.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Springer, O Telephone No. +49 89 2399-2619 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/04895**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-10 as originally filed

Claims, Numbers

1-4 as originally filed

Drawings, Sheets

1/3-3/3 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
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International application No. **PCT/GB 03/04895**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

III. Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 4

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☒ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. 4 are so unclear that no meaningful opinion could be formed (*specify*):

see separate sheet

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the said claims Nos.

2. A meaningful international preliminary examination cannot be carried out due to the failure of the nucleotide and/or amino acid sequence listing to comply with the standard provided for in Annex C of the Administrative Instructions:

☐ the written form has not been furnished or does not comply with the Standard.

☐ the computer readable form has not been furnished or does not comply with the Standard.

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1 to 3
	No: Claims	
Inventive step (IS)	Yes: Claims	1 to 3
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1 to 3
	No: Claims	

2. Citations and explanations

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/04895**

see separate sheet

Re Item III: Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

No examination of the claimed invention as to novelty, inventive step and industrial applicability is carried out for claim 4 because claim 4 relies on references to the drawings (see Rule 6.2(a) PCT and the PCT Preliminary Examination Guidelines, PCT/GL/IV, Chapter II, 4.10).

Re Item V: Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement.

1. Technical Field:

Method of calibrating bias drift with temperature over an operating temperature of a vibrating structure gyroscope.

2. State of the Art:

The following documents have been considered for the purposes of this report:

D1: S. K. Hong: "Compensation of nonlinear thermal bias drift of Resonant Rate Sensor using fuzzy logic"; Sensors and Actuators A, Elsevier Sequoia S.A.; vol. 78, no. 2-3; 14 December 1999

D2: GB-A-2 327 265; British Aerospace PLC; 20 January 1999

Document D1, which is considered as being the closest prior art to the subject-matter of independent claim 1, describes the compensation of nonlinear thermal bias drift of resonant rate sensors by using fuzzy logic. Document D2 discloses a method for reducing bias error in a vibrating structure gyroscope.

3. Independent Claims: Claim 1 (apparatus).

4. Novelty and Inventive Step - Articles 33(2) and (3) PCT

4.1 Independent claim 1:

The subject-matter of independent claim 1 differs from document D1 in that a response mode signal is separated into a real component induced by applied rotation

and a quadrature component which is an error term. Primary drive means voltage which corresponds to a change in quality factor, vibrating structure frequency, secondary drive quadrature component values which correspond to real component bias errors and secondary drive real component values which correspond to a change in bias are measured to calculate a set of bias calibration coefficients.

By using this calculated set of bias calibration coefficients, the objective technical problem is solved to improve the performance of the bias drift over temperature. Such a calculation is not known nor rendered obvious by the cited prior art. Hence, the subject-matter of present claim 1 is considered as being novel and inventive. The requirements of Article 33(2) and (3) PCT are fulfilled.

4.2 Dependent Claims 2 and 3:

The dependent claims 2 and 3 relate to preferred embodiments of the apparatus according to independent claim 1. Therefore, the requirements of Article 33(2) and (3) PCT are also fulfilled.

5. Industrial Applicability - Article 33(4) PCT

The invention as claimed in claims 1 to 3 is industrially applicable in the field of calibrating bias drift with temperature of vibrating structure gyroscopes.

6. Certain defects in the international application

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in document D1 is not mentioned in the description, nor is this document identified therein.